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AUTHOR Karweit, Nancy L.; And Others
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ABSTRACT

Peer associations within schools are important influences on educational orientations and aspirations. The many studies in this area, however, have not produced a comprehensive and detailed theoretical account of peer socialization effects, thereby impeding the design and implementation of more effective school organizations. Although schools provide differentiated settings and activities which affect peer interaction patterns, it is questionable to assume that the most important settings for these interactions are consonant with school organizational boundaries such as the entire school, curricular tracks, or classroom. Informal peer groups, not necessarily defined by classrooms, are important sources of influence on students as demonstrated by social network analysis. There is a need to develop a more adequate conceptualization of how school organization affects peer social structures and processes by investigating factors of academic achievement, friendships, school size, and extra-curricular activities. (Author/HLM)

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THE CONDITIONS FOR PEER ASSOCIATIONS IN SCHOOLS

Grant No. NIE-6-78-0210

Nancy L. Karweit

Stephen Hansell

Margaret Ann Ricks

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The Johns Hopkins University

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through four programs to achieve its objectives. The Studies in School Desegregation program applies the basic theories of social organization of schools to study the internal conditions of desegregated schools, the feasibility of alternative desegregation policies, and the interrelation of school desegregation with other equity issues such as housing and job desegregation. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. It has produced a large-scale study of the effects of open schools, has developed Student Team Learning Instructional processes for teaching various subjects in elementary and secondary schools, and has produced a computerized system for schoolwide attendance monitoring. The School Process and Career Development program is studying transitions from high school to post secondary institutions and the role of schooling in the development of career plans and the actualization of labor market outcomes. The Studies in Delinquency and School Environments program is examining the interaction of school environments, school experiences, and individual characteristics in relation to in-school and later-life delinquency.

This report, prepared by the School Organization program, reviews the literature on the effects of peer socialization processes in schools and suggests future research to determine how schools and the schooling process provide opportunities for peer interaction and influence the nature of the interaction.

Abstract

Peer associations within schools have long been viewed as important influences on educational orientations and aspirations. This paper reviews studies which address the ways in which the organization of schools affect peer interaction patterns, focusing on three main issues--the nature of the sources and objects of influence, the content and form of the influence relations and subgroup differences in peer relationships. For each issue, we discussed specific ways in which future research might be productively directed to help understand how schools as organizations affect the opportunities for and the nature of peer socialization processes.

Introduction

There has been a long standing and frequently lively interest in how features of peer groups within schools affect the educational orientations, aspirations and achievements of their individual members. Investigations of peer group processes and effects have followed two separate paths--studies of the consequences of student-body composition or climate (contextual effects studies) and studies of the consequences of more proximate environments of individuals (interpersonal effects studies.) These contextual and interpersonal effects studies both focus on peers as part of the socialization process in schools, but this common underlying theme has not been acknowledged (but see Bidwell, 1972a). When both contextual and interpersonal effects have been addressed, they have often been posed as competing views of peer associations (Campbell and Alexander, 1965; Alexander and Campbell, 1964; McDill and Rigsby, 1973). Instead of a unitary approach to peer influence processes in schools we have fragmented views which result, for example, in studies examining the effect of school racial composition while ignoring features of the setting in which these relationships occur.

The lack of a comprehensive view of peer influence has significantly impeded the advancement of knowledge about peer effects. The view of this paper is that the central problem facing peer effects studies is lack of theory, not methodological problems--unless major strides in conceptualization occur, methodological advances will be of little consequence. This paper focuses on the development of an adequate conceptualization of peer socialization processes in schools. We suggest

three issues of particular importance, describe how previous peer studies have largely failed to address these issues, and suggest how future research might illuminate these issues. Our literature review is therefore selective and oriented toward the specific conceptual themes to be developed in the paper.

Our general aim is to articulate how schools and the schooling process determine the opportunities for peer interaction and condition the nature of these associations. Specific school practices and characteristics prescribe differentiated opportunities for peer socialization. Through such characteristics as student body composition and differentiation practices, schools create settings for student interaction. Features of these settings, especially the structure of activities, condition how these opportunities for interaction are translated into peer associations. The first theme we wish to develop, then, is how settings and activities affect students' opportunities for associations and condition their development.

The second issue is the need to consider more carefully the form and content of social relationships through which peer influences are believed to operate. Studies typically focus on a single relationship between peers, namely friendship, but it is likely that other relationships, such as esteem, enmity, and indifference affect peer attitudes and orientations as well. Moreover, the effect of one type of relationship (e.g. friendship) may be conditioned by the operation of other relationships (e.g. enmity or esteem), suggesting the importance of simultaneously considering multiple relationships. Thus an expansion of our view of the content of the relationship is a central issue in this paper.

Research on the form of the relationship has been simplistic as well, focusing only on face-to-face, or direct, contacts. Less proximate or indirect ties such as friends of friends may also be important influence sources. Consideration of the form and content expands our view of peer relations in two ways: one, to consider the multiple, overlapping and sometimes conflicting bases of association (content), and two, to consider indirect as well as direct contacts as components of social interaction (form).

Finally, peer effects research has not examined how individual differences influence the nature of peer relationships. Although there has been some limited examination of sex and race differences in interaction patterns, the effect of other individual attributes such as personality have not been explored. Without considering the characteristics of individuals, our view of the peer process remains mechanistic and incomplete.

I. Settings and Activities

What are the settings within the school that provide opportunities for students to develop friendships and other peer relationships, and how do features of the school determine these opportunities? What student activities take place within these settings and how do they influence peer relationships? These questions concern important but usually unrecognized influences of the organization of schools--the opportunities for and conditions of peer associations.

Peer effects research has not directly addressed how settings and differentiated activity structures affect peer associations (for an

exception see Bossert, 1978). The settings are assumed to coincide with school organizational boundaries--classrooms, tracks, or schools--thus alternative units of student social structure have not been explored. Although the conventional settings may well be most important, we need a framework for peer socialization models that will permit the detection of the most consequential social settings for peer associations. However, because most studies have analyzed the conventional settings, our discussion will consider them first.

A consensus about the appropriate level for the analysis of school effects does not exist (see Burstein, 1976 for a discussion of the statistical and theoretical rationale of this debate). There are really two questions--what is the appropropriate level of analysis for the object of school influences, and what is the appropriate level of analysis for the source of school influences? Most studies consider the individual as the object of the influence but locate the source in different domains such as classrooms, tracks or schools. Despite the likelihood of multi-level sources of influences, most studies have considered the effects of a single type of source only (e.g. classroom or school) and usually for an individual student only. A given level has usually been treated independently from those either more or less inclusive. Also, the effects which have been investigated have usually been conceptualized as influences on individual students. Thus, more complicated models which consider multi-level sources and objects have not been entertained.

A. The School as an Influence Source

Since Wilson suggested in 1959 that the socioeconomic composition of the school was an important factor in individual students' college

plans, investigations of school-based influences have proliferated. The history of these studies over the past decade has been particularly stormy, marked first by debates over methodological techniques (Hauser, 1972, 1976; Farkas, 1976) and more recently over hidden value assumptions of the research (cf. Fennessey and Karweit, 1976; Fennessey and McDill, 1979). It is important to recognize the ambiguous results of these debates. There is no clear evidence that student body composition differences between schools do or do not affect the achievements or aspirations of individual students. In fact, the persistent methodological and conceptual differences of research in this area suggest that the basic idea has not yet been adequately tested. We now review some major studies in the school context area which highlight these themes.

Although the Coleman Report (1966) was not the first study to suggest the importance of student body composition for individual student orientations and achievements (e.g., Wilson, 1959; and Michael, 1961), it was the most publicized study in this area. This landmark report found that minority and disadvantaged students who attended schools with more advantaged students achieved better test scores. Numerous criticisms of these findings ensued, some involving detection of technical errors (e.g. use of wrong variables, Smith, 1972), some involving issues of interpretation of effects (e.g., assignment or selection vs. influence, c.f. Smith, 1972), others involving issues of measurement of effects (c.f. Bowles & Levin, 1968, on the use of school averages), and lastly, others questioning the validity of this type of contextual effects research in general (Hauser, 1971, 1969). We will not reiterate these debates in detail, but will summarize the main issues.

Coleman, like Wilson and other researchers before him, viewed the climate of the school society, net of the personal attributes of individual students, as an important source of influence on students' values, academic achievements and aspirations. Phrased concretely, students with similar characteristics were expected to have different educational achievements and attitudes in schools of differing ability or socioeconomic composition. Specifically, attending school with students from advantaged socioeconomic backgrounds was viewed to positively influence achievement.

Davis (1966) as well as others (Meyer, 1970; Nelson, 1972; Alexander and Eckland, 1975, 1976) pointed out that high socioeconomic composition has negative effects as well because the accompanying high ability context decreases self-evaluation and subsequently lowers aspirations. Thus, offsetting contextual effects may balance and thereby cancel each other.

Despite the apparent plausibility of the offsetting and balancing contexts argument, it too may be the result of methodological artifacts. Karweit, Fennessey and Daiger (1978) suggested that the high correlation between SES and ability context (i.e., multicollinearity) may statistically produce offsetting and balancing contextual effects and that the interpretation of these effects without additional evidence is hazardous. A more thorough specification of the process through which compositional variables affect individuals is required before artifactual explanations of these results can be eliminated. Alwin (1976) suggested one likely mechanism. He reasoned that if the negative effect of ability context occurs as a response to the degree of competition in the school, then direct evidence, such as students' perceptions of greater competition,

should be found in high ability context schools. To our knowledge, no studies of this sort have been done. Without additional evidence of the influence of ability or SES context, the artifactual bases of these effects remain very likely explanations.

Unfortunately, there is another difficulty with the interpretation of offsetting and balancing contextual effects. As many commentators have noted, it is highly doubtful that a uniform context--ability, SES or racial--exists within schools. Instead, schools may be more accurately viewed as composed of subschools within which students of similar characteristics and educational aspirations are likely to mix. Tracking practices and curricular placement in high schools certainly differentiate students in secondary schools. It is unlikely that the same norms for achievement, for example, exist across curricula within the same school, introducing systematic error into the use of school averages.

This criticism of the use of school averages as an influence source does not mean that the school is therefore unimportant in the influence process. The problem is to appropriately specify the role of the school in the peer influence process. This criticism does mean that other sources within the school, such as the curriculum or classroom, may be more appropriate sources of normative and comparative influence on which to focus. Some studies have concentrated on the curricular track in secondary schools and the classroom in elementary schools. In both cases, the intent has been to refine the conceptualization of the source of influence.

B. The Curriculum as a Source of Influence

Placement in a specific curriculum may be an important determinant

of student opportunities for interaction. Alexander and McDill (1976) suggested that curriculum membership exerts effects on outcome variables not only directly, but also indirectly, by creating groups of homogeneous peers. Karweit (1976) found that curriculum placement was a principle determinant of friendship selection and argued that differentiation practices were of major importance in shaping the friendship structure within schools.

These studies point to the importance of curriculum placement as a definer of the quantity of student interaction. Another study has suggested that tracking settings represent qualitatively different environments as well. Rosenbaum (1975) characterized the college preparatory track as a setting in which self-direction and the expression of individual interests are encouraged. In contrast, non-college tracks provide a setting in which conformity is rewarded. Rosenbaum's case study points to some potential consequences for peer associations within each curriculum. We might expect, for example, to find different bases of affiliation in peer groups formed in the different curricula. However, we are unaware of any study that addresses these issues.

C. The Classroom as a Source of Influence

The effects of classroom organization on peer relationships have been investigated in several recent studies. The most frequently examined dimensions of classrooms have been the open versus traditional continuum, and the system of tasks, rewards and authority relations. These two characterizations of classroom organization are often, but not always consistently, associated. Because comparisons across these two characterizations are ambiguous, we separately discuss open/traditional

and task/reward/authority classroom studies.

Hallinan (1976, 1979) and Epstein (1978) have compared peer relationships in open versus traditional classrooms. Both found that open classrooms had a more uniform, less hierarchical distribution of friendship choices received, with fewer isolates and sociometric stars. However, Epstein (1978), in contrast to Hallinan (1976), found that students in open classrooms had more mutual friends, and they made and received more friendship choices in open compared with traditional classrooms. These disparities may be due to differences in their sociometric instruments and the ages of the students in their samples. In a subsequent study, Hallinan (1979) reported no differences in number and size of the student cliques in open and traditional classrooms.

Another way to characterize the organization of the classroom is by its system of tasks, rewards and authority. Slavin (1978) described these three elements as the essentials of the instructional technology of the classroom. Task structure refers to the number of tasks, the way teachers group students to do the task, and the mode of instruction, such as lectures, discussions, recitations or small work groups. Rewards are allocated for performance of the task and can be based upon individual students' own performances only or upon their performances relative to other classmates. Rewards for students' relative performance can be based either on competitive or cooperative activities. Finally, the authority structure refers to the extent of control students have over learning activities in the classroom.

Bossert (1977) distinguished between multiple-tasks (e.g., individualized instruction) and single-tasks (e.g., whole group instruction)

and pointed out that this distinction affects authority relations and the reward structure in the classroom. When the entire class is engaged in the same activity (whole group instruction), the teacher controls the choice of activities, the pace of instruction and the sequence of the lesson. Public question and answer sessions are used by the teacher to gain information about whether students understand the material and to concentrate student attention on the lesson. In the question and answer sessions, the class is able to view and evaluate the relative performances of its members. In order to seem fair, teachers must use a reward system based on relative ranking of class members. This ranking may increase in significance if the tight teacher control of activities does not provide opportunities for other characteristics of students to be seen.

Another consequence of whole group instruction (Bidwell & Kasarda, 1978; Bossert, 1978) is the effect that teacher rankings have on peer group structure. In classrooms dominated by whole group instruction, interpersonal friendships are more likely to be based on students' task performances and their relative rankings by teachers (Bossert, 1978). The best students probably receive the most friendship choices and are sociometric stars. The worst students are likely to be unpopular or sociometric isolates.

In contrast, when students are not engaged in a common task, interpersonal ties are not as likely to be based on task performances or relative ranks within the class. Bossert argued that in multiple-task classrooms, children are much more likely to establish affective ties on bases other than performance recognition. This argument parallels

much of the discussion of the benefits of the open classroom, which has been claimed to offer exposure to multiple attributes of students, not just teacher-rated academic performance (cf. Hallinan & Tuma, 1978).

Variations in the reward structure independent of task structure are also important for peer relationships in classrooms. Slavin (1978) reviewed the effects of various cooperative learning techniques on peer associations. Of particular interest is the consistent and dramatic finding that students working together in teams for a common, cooperative reward express increased group liking and cohesion, and exhibit increased interaction and friendship with students of different races and sexes.

Because certain tasks and reward structures imply specific authority structures, separating the effects of these characterizations is a problem. Classrooms with tight teacher control and individualized instruction, for example, are virtually nonexistent. What we do know from Bossert's work and from studies of open classrooms is that greater student initiation of activities exposes individual students to a wider range of the individual attributes of their classmates. This exposure permits friendship groupings to be based on more heterogeneous criteria.

D. Dyads, triads and friendship groups as sources of influence

Close friends in school have long been considered as important sources of influence, and numerous investigations have sought to document the socializing power of the peer group (Coleman, 1961; Simpson, 1962; Herriott, 1963; Campbell and Alexander, 1965; Kandel, 1978; Epstein, 1978; Duncan, Haller and Portes, 1971).

Although investigations of the socialization function of all environments have to rule out self-selection as an alternative cause

of effects, nowhere is this problem more evident than in discussions of the effects of close friendships on student outcomes. The problem is simply stated. Imagine that two students who are friends and have been friends for some time have similar educational goals. What interpretation can be make about the role of this friendship in determining their educational aspirations? They could have selected each other as friends because of similarity in educational goals or because of similarity in antecedents to educational aspirations. Or, they could have had quite different original goals and been socialized to similar aspirations through their friendship. Selection and socialization are alternative explanations of the same phenomenon.

Separating selection from socialization effects is critical to interpret observed similarities among friends. When cross-sectional data are analyzed, selection factors are statistically controlled and then the resulting partial associations are attributed to socialization processes. This procedure characterizes much of the sociological literature on peer effects. A well-known example is the Wisconsin model which examines peer socialization influences in terms of educational and occupational status attainment (Sewell, Haller and Ohlendorf, 1970; Hauser, 1972; Haller and Portes, 1973).

A more direct way to address the selection vs. socialization issue is to obtain longitudinal data on friendships and to observe changes over time in friendship groups and educational goals. Results from this type of study suggest that similarity is an important element in the selection process (Cohen, 1977; Kerckhoff, 1974), but that socialization takes place as well (Epstein, 1978; Kandel, 1978). These studies differ

in the relative weights that they accord to socialization and selection but, taken together, suggest that both processes shape peer associations.

E. Other Potential Sources of Influence

Prior research has assumed that peer associations can be most directly affected through classroom interventions such as open vs. traditional arrangements (Epstein, 1978; Hallinan, 1976, 1979). However, we have no empirical evidence on whether most student friendships are actually formed and maintained inside or outside of classrooms. The first research issue is to determine which school settings are the scenes of student friendships.

The opportunities for interaction between every pair of students based on their joint presence in school settings can be compared with actual friendships reported on a sociometric questionnaire or observed in the school. One line of analysis could focus on individual differences in the use of settings for friendship formation and change. We expect that students participate more, and therefore have more friendships, in school settings and activities that most interest them. Settings in which students of varying sex, race, age, achievement and maturity do and do not have friends can be identified. Good students, for example, would be expected to make more friends in classes or academic extracurricular activities, while good athletes may form more friendships in athletic extracurricular activities.

We can also examine the friendships of students with multiple, potentially conflicting memberships (cf. Hallinan, 1978). Do students who are both high achievers and good athletes, for example, choose friends from one or the other membership group, do they maintain friendships

in both membership groups, or do they perhaps have friendships based on completely different criteria of association?

The focus of analysis can also be shifted from individuals to the characteristics of school settings in which opportunities for association are translated into actual peer friendships. A number of investigations have identified important dimensions of student perceptions of classrooms (cf. Moos, 1969; Epstein and McPartland, 1979), but none of these studies has linked the characteristics of school settings (other than classrooms) with peer structures occurring in them. A reasonable speculation is that more opportunities for interaction will produce actual friendships in school settings in which (1) students have regular face-to-face contact, (2) students have more control over their physical proximity, and (3) there are fewer institutional constraints on the choice of friends, such as curricular tracking.

F. Other Potential Objects of Influence

Most peer-effects studies have searched for evidence of peer influences at a single level of analysis--the friendship dyad. Even in studies where schools, classrooms, or groups of peers have been conceptualized as sources of influence, the objects of influence have been operationalized as some characteristic of dyads such as attribute similarity. Yet, social interaction is surely richer than the conceptual view implied by dyadic analysis. What has been ignored is the possibility that important peer processes occur in wider peer group contexts, which classroom and school organization may influence strongly. There is little research about peer influences that operate in groups intermediate in size between friendship dyads and classrooms, largely because

we have lacked a precise way to describe the structure of these groups (for a partial exception see Karweit, 1976).

This section suggests how descriptions of peer structures provided by network analysis can help fill these conceptual and empirical gaps. Network analysis allows the description of naturally occurring peer structures in groups of any size. We can study dyads, triads, social circles, large cliques, and sets of cliques simultaneously (Alba and Moore, 1978). Then we can trace communication and influence flows among peer structures by studying individual contacts between peer groups of varying size. Finally, we can map the constraining influences of school organization and schedules on peer structures. Thus the linkage between school influences, peer groups, and individual outcomes can be articulated.

Network analysis is a set of techniques for describing the structure of peer contacts. Individuals in a network are designated as points, linked by a set of lines representing relations of a given type. A network is the collection of points and lines and is characterized by the patterns found among them (Mitchell, 1969).

Our basic premise is that the structure of peer groups larger than dyads may affect peer processes. We start by noting that the addition of one person to a dyad dramatically changes its character. Dyads have three distinct structures: no ties, mutual ties, and unreciprocated ties. In triads there are 16 different combinations of unreciprocated, mutual ties, and no ties. The major difference between these 16 combinations is their "transitivity." Given that A likes B and B likes C, then the triad ABC is transitive if A also likes C and intransitive if A and C dislike each other. Davis and Leinhardt (1972) argued that

intransitive triads cause psychological discomfort and are therefore avoided. The fact that almost all triads in naturally occurring groups are transitive supports this view (Holland and Leinhardt, 1978).

The ordering of individuals in a transitive triad has theoretical implications for their relative status. According to Homans (1974), a three-person group is the smallest in which status and friendship dimensions of social structure necessarily operate. Mutual choices tend to be made between people of the same status rank and contribute to the formation of clusters or cliques. Choices between status levels tend to be unreciprocated and go from lower to higher status individuals. In this view, triads are the elementary social units of status hierarchies in organizations.

Extending Homans' view, we can theorize that friendship and status processes operate at different levels of peer structure. Friendships are probably based on diffuse and idiosyncratic interpersonal evaluations that are most frequent in dyads. Status comparisons based on widely accepted norms of achievement, on the other hand, may occur in transitive triads. In schools, students probably compare their own grades with grades of better or worse students with whom they have unreciprocated rather than mutual friendships. From Homans' theory we would expect stronger individual attributions of success and failure to occur in triads rather than in dyads.

The importance of testing this hypothesis about differences between peer processes in dyads and triads depends on the frequency with which students form each structure under natural school conditions. Unfortunately, little ethnographic or systematic evidence about naturally occurring

peer structures exists. Clearly, we need to identify the peer structures that are most common and therefore most important to understand.

The rationale for expecting different student influence processes at different levels of peer structure can be derived from social psychological theories of group processes. We can speculate about the most appropriate levels of peer analysis to search for some of the important student outcomes listed by McPartland, Epstein, Karweit and Slavin (1976). The student abilities which they called "situational coping skills" are particularly likely to be associated with peer group processes because most of these coping skills refer to social situations. Leadership, for example, is a skill that requires at least a small peer group for its expression. As another example, peer influences included under the much-abused label of "conformity processes" are strongest in medium-sized groups of 4 to about 15 students. "Organizational abilities" can be investigated only with reference to the student organization in which they are exercised. We can examine these and other outcomes of peer processes in schools by carefully studying naturally occurring peer groups larger than dyads, which can be described with network analysis.

In summary, there are important peer processes and outcomes that cannot be investigated at school, classroom or dyadic levels of analysis. Social network analysis provides the methodological and conceptual tools to investigate peer relationships and is free of many of the problematic assumptions of conventional levels of analysis.

II. Form and Content of Peer Associations

A. Implicit Assumptions in Present Research

When network analysis is used in peer effects research, the points and lines of network structure have little intrinsic meaning; thus researchers must consider exactly who the sources and objects of influence are (form) and exactly what is being transmitted (content). This interpretive process stimulates theory development and should contribute to a more productive line of future inquiry.

Except for Woelfel and Haller (1971) and McCallister and Fischer (1978), peer effects' researchers have not considered what might be transmitted in the process they loosely refer to as influence. Instead, existing studies assume that friendship, as a relationship involving time and commitment, will bring individuals closer together and increase their similarity (Marlowe and Gergen, 1969). If individuals who are friends have the same educational orientations, this similarity will probably enhance the stability of the friendship. If these friends do not have similar orientations, a condition of imbalance exists, which is assumed to be psychologically distressing (cf. Heider, 1958). This distress can be reduced by ending the friendship or by one or both members altering their values. The emphasis has been placed on how the formation of "good" peer groups might result in alteration of educational goals. This model of peer socialization is really an assimilation-on-values model with friendship providing the modus operandi.

There are some theoretical and practical problems buried in these assumptions. First, there is no direct evidence that psychological discomfort occurs because friends have different educational goals.

Moreover, there is no direct evidence that youngsters perceive the friendship and status characteristics of their associates in the same ways as do adults. Proximity and joint activity may be more important determinants of young children's friendships than are more complex attributional criteria such as power and prestige (Epstein, 1978). Second, the full implications of this assimilation approach are often not clearly articulated. The dyadic view implies that peer socialization to different values occurs only through close friendship ties. However, other peer relationships--such as admiration for someone quite different from oneself--may be more important socialization sources than close friendships. More importantly, the whole notion of assimilation as a desirable end result of the peer process should be examined. A more realistic and sensitive result, given existing cultural diversity, would be to foster diversity without conflict and isolation. Thus an alternative, perhaps more desirable peer structure would be one in which diverse cultures can exchange information and support without necessarily becoming more similar.

Granovetter's (1973) differentiation between strong and weak friendship contacts helps illuminate this point. Compared to weak contacts, strong contacts take more time, involve more emotional intensity and intimacy, and require more reciprocal exchanges of services. Mutual choices are strong contacts, while weak contacts are often unreciprocated. Contacts within peer groups tend to be strong, while contacts between groups, called bridges, are necessarily weak. He further showed how the existence of bridges facilitates communication between groups and pointed out the paradox that intra and intergroup cohesion tend to be

inversely related. More weak contacts in a network increase the bridges between groups, and produce greater cohesion and communication between groups. Highly cohesive peer groups in a network with few weak contacts, and consequently few bridges, are likely to be polarized and mutually isolated.

As "gatekeepers" of information flow, students in bridge relationships are particularly important in the spread of new information among peer groups or in student decision-making requiring cooperation between cliques. Applying Granovetter's findings to the biracial school setting suggests that racial integration in the classroom can be achieved by arranging classroom structures to produce enough weak contacts to connect black and white cliques, rather than by encouraging strong biracial friendships. This result would be immediately applicable in schools because weak ties are easier to stimulate through realistic organizational innovations (Hallinan and Tuma, 1978). If the idea that racial integration has to occur in strong contacts at the dyadic level can be relaxed, many possibilities for planned interventions in schools to foster racial accomodation become feasible.

The distribution of weak ties in a network may have implications for student decision-making processes across school settings. Our hypothesis is that school settings with numerous strong relationships would tend to have relatively even distributions of friendship choices and student status and a large number of small, cohesive cliques based on mutual choices. The infrequency of weak choices and bridges would decentralize decision-making. In extreme cases decision-making would be nearly impossible because the cliques would lack the bridges

necessary for communication and coordinated action. These work groups would be pleasant but inefficient. By contrast, groups with externally imposed structure, and more weak contacts, would be expected to have well-defined status hierarchies with a few highly visible sociometric stars. There would probably be fewer, but larger, sociometric cliques, with less cohesiveness and more cross-cutting bridge connections based on unreciprocated choices. Decision-making would be more centralized in the hands of a status elite. Average group member satisfaction would be lower, but the decision-making efficiency of peer groups would be higher than in groups based on strong ties.

Finally, the study of contacts between groups can be used to discover the criteria for friendship and status within school networks. We can locate individuals or cliques at varying levels of the status hierarchy according to the structure of their mutual friendships within peer cliques and largely unreciprocated choices between cliques. Then we can make inferences about the criteria underlying student status by examining the individual attributes of students in representative network positions (see Burt, 1977). This method avoids the social desirability bias inherent in self-reported measures of student status. It also allows the possible discovery of different status criteria at different levels of the student hierarchy. Thus it may be possible to refine theories of status attainment and maintenance in schools by using the structure of social interaction in student networks as an empirical base.

In summary, strong mutual friendships among diverse types of students have traditionally been argued, at least implicitly, to comprise a desirable peer structure. However, alternate views of the nature and importance of peer relationships may be required as part of the developing demands for pluralism and accomodation to diversity in the schools. The next section indicates how the perspective of social networks is suited to this broader view of the peer socialization process.

B. Alternate views of the nature and importance of peer relations

1. Multiple bases for affiliation

Relationships in addition to friendship are potentially significant in the socialization process. Admiring someone or wishing to be like someone else may be more important than friendship for changing aspirations. Disliking someone and wanting to outperform that person may be another important source of goal orientation. The entire constellation of relationships, rather than one single relationship such as friendship, must be considered to fully understand the nature of peer socialization.

In social network terms, an individual's association with others on the basis of diverse attributes is called multiplexity. Figure 1 portrays a student (John) and his multiple social relationships. John, Alex and Ray are mutual friends (double-headed arrows indicate mutual friendship ties). John, however, has other ties that are specific to certain activities (playing football, doing homework, dating) or to certain feelings (dislike, esteem).

Different associational criteria may yield very different pictures of student peer structures. Students who are not friends, for example, may respect each other and may, in fact, interact regularly in school

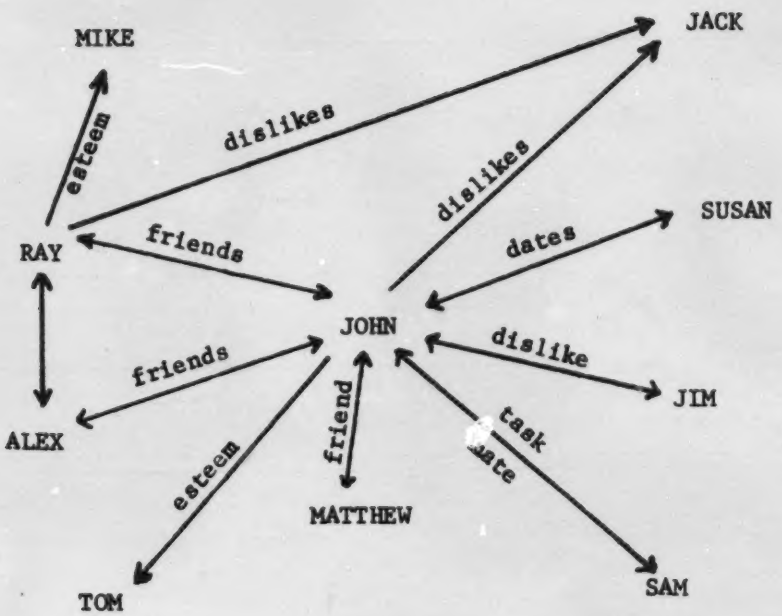

Figure 1: Multiple Social Relationships

achievement settings. If students' achievements in school settings cause them to respect but not necessarily like one another, then it is crucial to our understanding of peer influences on achievement aspirations to tap this kind of student association. In general, the content of student associations may shape specific peer influences and outcomes.

Researchers on multiple bases of association must clearly specify the kinds of student relations that they think are most important. Relations can be defined in terms of affective content, normative content (sets of expectations and obligations between occupants of social roles such as student-teacher) and exchange content [where actions of a pair of actors jointly affects their outcomes (see McCallister and Fischer, 1978)]. Students' exchange relations are clearly important for understanding their educational and occupational orientations (Woelfel and Haller, 1971), but little is known about the kinds of information, support and help that are actually exchanged by students.

A second general research issue concerns the likelihood that a given relationship may be based on more than one associational criterion, and that specific kinds of relations may tend to cluster together. We can speculate that strong ties between best friends involve many kinds of content. Best friends probably like each other (affective content), occupy similar roles (normative content) and trade information about homework (exchange content). Weaker ties are probably based on fewer content bases (e.g., competing candidates for a student government office may be linked by exchange of information only).

2. Indirect Ties and Social Distance

John's relationship with Ray (see Figure 1) exemplifies indirect ties in the network perspective. John may be influenced indirectly by

some attitude or attribute of Mike, with whom he has no direct connection, but with whom his friend Ray is connected. The importance of indirect contacts for peer socialization has not been explored but offers definite possibilities for broadening the view of socialization processes in schools.

A key property of indirect contacts is the "social distance" (McFarland and Brown, 1973) between any two individuals, which can be calculated as the number of communication paths that have to be traversed to link two individuals in a network (Harary, Norman, and Cartwright, 1965). A basic premise is that close friends and "significant others" (Woelful and Haller, 1971) among students' associates are likely to be reachable in short paths, while students who are unacquainted are most often separated by longer path distances. A reasonable hypothesis is that, in most circumstances, the probability of one student influencing another is an inverse function of the path distance between them (Burt, 1977). In addition, students in large, cohesive, highly-connected peer groups probably have relatively short path distances to other group members. Compared with path distances to students within their own group, path distances to students outside the group are probably much greater.

The separation of interactional distance from proximity and similarity measures gives us an independent way to measure the influences of school grouping and scheduling practices. Most studies of school effects on peer interaction have used the similiarity of student attributes as the dependent variable. These studies clearly do not detect influences that do not change attribute similarity or that operate through indirect peer contacts.

The use of path distances also makes it possible to compare the interactional distance of individual students to any group in the peer network, or between peer groups. Social distance can then be interpreted in terms of the attributes of students in particular social roles. For example, we could examine the path distances between students and leaders of a variety of activities and friendship groups. Students with short paths to the leaders would be expected to aspire to the academic, athletic or other criteria of status represented in leadership roles. Students distant from student leaders would be most likely to eschew the norms of that group. A good deal of students' alienation from school may be associated with their lack of indirect contacts with student leaders and their consequent inability to contribute to student decision-making processes.

A final use of social distance is to link the multiple bases of student associations. Social distances among students can be calculated for each relational criterion, such as friendship, esteem and the exchange of information, resulting in separate social distance matrices. Then we can address the question of how these relational criteria are interdependent, and how each criterion contributes to a "joint role structure" (Breiger and Pattison, 1978). There are a number of multivariate techniques for identifying joint role structures (Burt, 1978). Essentially, individuals are grouped according to the similarity of their distances to other students in terms of all of the relational criteria simultaneously. The joint role structure is an abstraction of the relational information that is common to the separate matrices. Students sharing the same role are not themselves necessarily associated, but they do have relationships with other students that are similar in form and content. The most

important criteria underlying the joint role structure can be identified by examining individual characteristics of students who share joint roles. Some joint roles may turn out to be grouped largely on the basis of proximity criteria, others may be more strongly based on esteem or information exchange. These techniques are new and their applicability to school networks has not yet been demonstrated, but they have the potential to identify important relationships between the form and content of peer associations.

III. Subgroup Differences in Peer Associations and Influences

Individual attributes may also condition the form and content of peer associations. Because students' sex, race and age represent the most pervasive and visible grouping characteristics in both school opportunity structures and natural peer groups (Coleman, 1961; Glidewell, et al., 1966; Gronlund, 1959), they should have important effects on the form and content of peer associations. Few studies have explicitly examined such differences, particularly beyond the level of the dyad.

Sex differences in friendship structures have received the most attention. Eder & Hallinan (1978) found that the friendship dyads of fifth and sixth grade girls, observed over a school year, were less fluid in their membership and more exclusive in admitting newcomers than boys' dyads. Boys' dyads tended to become triads, or join into larger groups. It has often been reported (cf. Epstein, 1978; Karweit, 1976; Hansell, 1979) that high school girls have more mutual friendships than boys. Maccoby and Jacklin (1974) suggested that boys get more practice in action-oriented peer games in large play groups, but girls spend more time in one-to-one relationships with parents or adult care-givers.

Overall, these studies suggest that girls are more involved and interested in intimate, mutual dyads than are boys.

There is little evidence on sex differences in the structure of larger peer groups (Halliman, 1978). Hansell (1979) found no sex differences in the frequency of membership in friendship cliques, nor was there a significant difference between the average size of boys' and girls' cliques. Deaux (1977) suggested that there is a sex difference in self-presentational strategies that may be relevant to peer structures. Boys attempt to assert their status while girls prefer more egalitarian relationships characterized by friendship and mutuality. There is some empirical support for this view in Hansell's study. Girls' friendships were associated with their personality development while boys' friendships were more strongly influenced by their socioeconomic and sociometric status with peers. Clearly, more research on sex differences in network peer associations needs to be done.

Several studies have addressed sex differences in the similarity of individual attributes in friendship dyads. Coleman (1961), Duck (1973) and Karweit (1976) all reported that girls in dyadic friendships were more homogeneous than boys with regard to background characteristics, which suggests that girls may be more influenced by friends on a variety of attitudinal and achievement outcomes.

The direct evidence of sex differences in peer influences in dyads is conflicting. Epstein (1978) concluded from her study of sixth, seventh, ninth and twelfth grade students that friends' influence on achievement, self-reliance, college plans and school satisfaction did not differ by sex. Kandel and Lesser (1969), however, found that peer influences on college plans were stronger for girls than boys. McDill

and Rigsby (1973) reported that such influences have a larger impact on boys than girls. One explanation for the inconsistency among these findings is the use of different measures of peer influence. Kandel and Lesser used concordance between adolescents and their friends on educational plans, while McDill and Rigsby used friends' average academic values. Although average academic values may indicate why boys plan to go to college, they may not carry the same message for girls. Scholastic commitment may be a stronger reason for boys to attend college than for girls, and access to social activities may be a stronger reason for girls than for boys. Other possibilities, discussed earlier in this paper, are that family influences or other levels of peer group structure more strongly influence college aspirations (see Epstein, 1978).

Most studies of race and peer groups have used traditional sociometric measures of student popularity, and found that within-race friendships are more frequent than cross-race friendships (Schofield, 1978). A number of studies have investigated gains in the frequencies of cross-race friendships in integrated schools (Schofield and Sager, 1977) or in classrooms using cooperative team instructional techniques (Slavin, 1977). To our knowledge, however, no study has compared the detailed structure within black and white friendship groups, nor related within-group structure to the frequency of biracial friendships between peer groups.

Another neglected area is the study of developmental differences in peer associations, although many studies have documented age trends in social roles. Gronlund (1959) and Glidewell, et al. (1966) reported that older students in school settings tended to have more mutual,

reciprocated friendships in dyads than did younger students; however, more recent studies (Epstein, 1978; Hansell, 1979) failed to find any relationship between age and mutuality in dyads. Leinhardt (1972), in a study of three-person groups of students in kindergarten through sixth grade, found significantly greater transitivity--the tendency toward tightly connected and hierarchical social structures--among older students. Taken together, these studies indicate that more developed (i.e. older) students participate in more complex social structures, but reliance on age as the criterion obscures developmental differences in peer group structures because of substantial maturational differences within age groups.

Hansell (1979) used Loevinger's (1976) concept and measure of ego development to study student roles in peer groups, and reported curvilinear trends in the social involvements of students across the developmental scale. Popularity, mutuality in dyads, and choices among friends were highest at intermediate maturity levels and low at the lower and higher levels of ego development. These results held only for girls, suggesting a sex difference in the association of peer structures with personality development. Girls at the highest maturity levels had unique roles as liaisons between cliques while also being involved in fewer mutual friendships in dyads. These results challenge the widely-held assumption that increased interpersonal mutuality always accompanies personal development, and, in keeping with Granovetter's (1973) theory of weak ties, suggest that under certain circumstances, imbalance in peer dyads facilitates the integration of larger network structures.

We need more studies of the development of individual social roles in student networks, and more studies of development in student networks

in response to organizational changes. Ultimately, it may be possible to design school arrangements that facilitate the kinds of peer structures that, in turn, produce the conditions that increase student achievement and maturity.

Summary and Conclusion

Peer associations within schools are important influences on educational orientations and aspirations. The many studies in this area, however, have not produced a comprehensive and detailed theoretical account of peer socialization effects, which has impeded the design and implementation of more effective school organizations. This paper reviewed studies addressing the specific ways that the organization of school settings affects peer interaction patterns in order to identify empirical and conceptual gaps in this research. Our intent was to highlight specific research issues which need to be included in an eventual comprehensive view.

Our review focused on three main conceptual issues--the nature of the sources and objects of peer influences, the content and form of the influence relation, and subgroup differences in peer relationships. Existing research in each area was described, and major attention was given to the assumptions implicit in typical research strategies. Then we suggested some new directions for research on each issue.

First, we discussed how schools provide differentiated settings and activities which affect peer interaction patterns. We questioned the assumption that the most important settings for the formation and influence of peers' associations are consonant with school organizational boundaries--the entire school, curricular track or classroom. We

concluded that informal peer groups, not necessarily defined by classroom boundaries, are important sources of influence on students, and suggested that social network analysis provides the tools to describe informal peer groups. When the search for sources of influence is expanded to include students' naturally occurring peer groups, several research issues are raised. Because high school students in particular experience numerous school settings through their daily schedules, we can ask in which of these settings will influential friendships occur, and whether these friendships are the result of multiple peer group memberships. Clearly, locating where the influential student associations occur is important for arranging organizational improvements.

Future research should also examine the interaction between formal school organization, such as curricular tracking, and informal peer associations. For example, extracurricular activities may dilute the distinctions imposed by tracking, especially if the activity involves non-academic criteria for success. Karweit's (1976) findings that the extent of cross-curricular friendship choosing was positively related to the extent of extra-curricular involvement suggests that participation in extra-curricular activities may ameliorate the segregating effect of tracking. On the other hand, extra-curricular activities may sometimes exacerbate the segregation effects. College preparatory students, for example, are likely to be leaders in extracurricular activities because of their favorable status; thus these activities may simply provide more opportunities for tracking distinctions to operate. The extent of the curricular-tracking and the school's pressure for academic performance may influence which extra-curricular settings overlap with and reinforce curricular ones.

We also need to examine school characteristics that might affect peer associations. For example, smaller schools may demand more participation in a greater range of school settings than do larger schools (Barker and Gump, 1964), and Karweit (1976) has extended this principle to student participation in friendship and other peer associations. Students in smaller schools tend to have more within-school friendships than students in larger schools. Because the opportunities for contact in the classroom are similar in small and big schools (assuming that class sizes are uniform), Karweit surmised that the extra-curricular activities and the pressures to participate could explain this finding. By involving more students in activities where skills in addition to academic ability can be viewed, the potential bases for friendship are greatly expanded. Common interests, perhaps not readily apparent, may become visible and provide a reason for engaging in other joint activities. There may also be qualitative differences in the peer associations. We would expect fewer sociometric isolates and stars in schools of smaller size. School size may thus affect both the level of peer involvement and its distribution.

This review also discussed the implicit assumptions of peer influence studies. Most studies have measured peer influence in terms of the increased similarity in the attitudes, values or achievements of friends in dyads. We questioned several assumptions of this definition of influence. First, although dyads may be the location of many influence processes, larger peer structures, such as friendship cliques and the connections between them, are also affected by school organization. Except for Hallinan's (1979) study of cliques under different classroom

formats, little research has been conducted on school organizational effects on peer groups larger than dyads. This area is particularly important to study if, as is likely, most naturally occurring peer groups in schools are larger than dyads.

We also questioned the implicit assumption that friendship is the only important peer relationship to study. Other relationships, such as the exchange of information and power relationships, should be important mediators of influence.

Also, we questioned whether mutual friendships, again in dyads, represent the ideal or most developed form of peer association. We used Granovetter's (1973) theory of strong and weak ties to argue that some imbalance or non-mutuality at the level of friendship dyads may in fact facilitate cooperation and communication between larger peer group structures. In this view, more cooperation and accomodation between diverse cultural subgroups may be better achieved by encouraging weak ties between peer cliques than by trying to foster strong bicultural friendships in dyads.

The goal of designing school organizations that increase cooperation between races leads us into the third major theme of subgroup differences in peer structures. We questioned whether peer associations are the same for students of varying race, age, sex and personality development. With the exception of sex differences in dyadic involvements, few studies have examined differences in peer group structures in subgroups of students.

It is likely that affective and interpersonal achievements, and possibly academic achievements as well, are strongly influenced by peer

structures and processes which are in turn shaped by school organization. Our eventual goal is to design organizational innovations that maximize academic and nonacademic student outcomes. Clearly, we need to develop a more adequate conceptualization of how school organization affects peer social structures and processes as a first step toward this goal.

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